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METHOD OF TEST FOR FREE LIME IN HYDRATED LIME

CAUTION: Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read "**SAFETY AND HEALTH**" in Section H of this method. It is the responsibility of the user of this method to consult and use departmental safety and health practices and determine the applicability of regulatory limitations before any testing is performed.

A. SCOPE

This method describes a procedure for determining the free lime expressed as $Ca(OH)_2$ in hydrated lime used in lime treated base. This is a modification of ASTM Designation: C 25, Rapid Sugar Method.

B. REAGENTS AND MATERIALS

Unless otherwise indicated, all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society.

C. APPARATUS

1. Glass tubing with an inside diameter of approximately 20 mm
2. A 200-mL volumetric flask
3. A wide-mouth bottle, 200-mL capacity
4. A porcelain mortar and pestle with an approximate capacity of 200 mL
5. A standard 150-µm sieve
6. A buret, 100-mL capacity

D. PREPARATION OF SAMPLE

1. Use a tube, about 20 mm (inside diameter), which is open at both ends, and pass it diagonally through the sample. Cover the end of the tube with the thumb and withdraw the tube. Shake the material out into a wide-mouth bottle.
2. Repeat this sample coring four times at different angles.
3. Cap the bottle and shake vigorously to mix.
4. Quarter the sample and discard three of the four portions.
5. Grind the remaining quartered portion using a mortar and pestle.
6. Grind and sieve the sample until the material passes through a 150-µm sieve.

E. TEST PROCEDURE

1. Weigh 0.500 g of the prepared sample and brush it carefully into a 200-mL volumetric flask containing about 20 mL of CO_2-free distilled water. Then,

immediately place a stopper on the flask The stopper should only fit loosely on the flask.

2. Disperse the sample thoroughly in the water by a swirling motion.

3. Heat the sample and boil it for 2 min.

4. Remove the stopper, add 150 mL of CO_2-free distilled water at room temperature, and then add 15 g of granulated sugar (sucrose).

5. Again, place a stopper on the flask, shake the flask vigorously for 5 min then allow the flask to stand for 45 ± 15 min.

6. Dilute the sample to the 200-mL mark. Mix the sample and filter it through dry paper.

7. Add two drops of phenolphthalein to a 100-mL aliquot and titrate it with standard HCl (0.15 to 0.5 N will give reasonable titration figures). Rapidly add the first 90 % of the acid requirement. Shake the flask and finish the titration more carefully, but as quickly as possible, to the first complete disappearance of pink color.

F. CALCULATION

Free lime as $Ca(OH)_2$ = mL of acid X normality of the acid X 14.82.

G. REPORTING RESULTS

Report test results on an appropriate test form.

H. SAFETY AND HEALTH

Prior to handling, testing or disposing of any of waste materials, testers are required to read: Part A (Section 5.0), Part B (Sections: 5.0, 6.0, 10.0 and 12.0) and Part C (Section 1.0) of Caltrans Laboratory Safety Manual. These sections pertain to requirements for general safety principles, standard operating procedures, protective apparel, disposal of materials and how to handle spills, accidents, emergencies, etc. Users of this method do so at their own risk.

REFERENCE:

ASTM Designation: C 25

End of Text (California Test 414 contains 2 pages)